

Pulpoks 2023

ESRF – RF group
LINAC and Injection Extraction unit
(M. Dubrulle, M. Morati)



| The European Synchrotron

ESRF Machine

- **Located in Grenoble, France**
- **The linear accelerator (or "linac")**
 - Electrons emitted by an electron gun are packed into "bunches" 200MeV
- **The booster synchrotron**
 - 300m ring circumference
 - Electron energy 6GeV
- **The storage ring**
 - 844m ring circumference
- **The beamlines**
 - Experiments take place in 44 beamlines
- **Refilling time every hour**
 - Different filling patterns depending on experiments schedule



LINAC AND INJECTION EXTRACTION UNIT PRESENTATION

The team, ASD (Accelerator and Source Division) – RF Group – Linac/Injection/Extraction unit

- **Marc Dubrulle (Head of unit)**
- **Mathieu Morati**
- **Hervé Delamare**
- **Philippe Henrissat**
- **Louay Khlaifi (2y period trainee)**

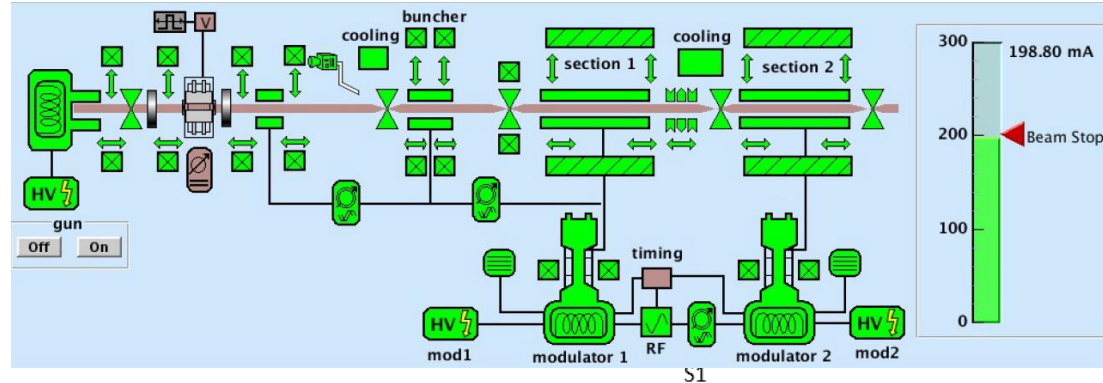
Group member main tasks:

- **Maintenance and follow up of LINAC equipment's**
 - Gun + accelerating sections
 - Klystron, modulators power supplies and auxiliaries
- **Maintenance and follow up Injection/Extraction equipment's**
 - Pulsed power supplies and magnets
- **Development and improvement of equipment's**
 - Design and development of new pulsed power supplies
 - Automation PLC and electronics dedicated to power supplies control for operation (control room)
- **Standby duty for operation**
 - 7days 24/24 standby for team members

LINAC AND INJECTION EXTRACTION EQUIPMENT PRESENTATION

LINAC zone :

- Gun 90keV
- Pre-buncher/buncher accelerating cavities
- 2 accelerating sections (200 MeV)
- 2 x 35MW pulsed klystron (TH2100 3GHz) with pulsed modulators



Injection/Extraction zone :

Booster injection:

- Kicker magnet (Ki) – 270A / square / 1us
- Septum magnet (Si) – 3kA / ½ sinus / 1.2ms

Booster extraction:

- Kicker magnet (Ke) – 980A / square / 1us
- Bumper magnets (B1-B2-B3) – 200A / ½ sinus / 4.5ms
- Septum magnet (Se1) – 3kA / ½ sinus / 1.2ms
- Septum magnet (Se2/1) – 10kA / square / 1.6ms
- Septum permanent magnet (Se2/2)

Storage ring injection:

- Kickers magnets (K1-K4) – 1800A / ¼ sinus / 60us
- Septum permanent magnet (S1)
- Septum magnet (S2) – 10kA / square / 1.6ms
- Septum magnet (S3) – 7.5kA / ½ sinus / 60us

